

SUPPORT FOR THE AMENDMENT

This Amendment amends the specification to correct a typographical error; and cancels Claims 4 and 6. Support for the amendments is found in the specification and claims as originally filed. In particular, support for the amendment to the specification is found in the specification at least at page 5, Table 1, No. 7 (a composition including "3.5" wt% Mn is a "Composition According to the Present Invention"). No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 5 and 7-9 will be pending in this application. Claims 5, 7, 8 and 9 are independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

The present invention provides an aluminum alloy for casting members such as ladder frames and cases for automobiles. The alloy exhibits a high Young's modulus of 90 GPa or more and a low linear thermal expansion coefficient of $18 \times 10^{-6}/^{\circ}\text{C}$ or less. Specification at [0001]; [0019].

Claims 4-7 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 4,919,736 ("Nishi"). Nishi discloses an aluminum alloy, containing 0-0.5 wt% Ni, for abrasion resistant die castings. Nishi at abstract.

Claims 5 and 7-9 are rejected under 35 U.S.C. § 103(a) over JP 2000-204428A ("Horikawa"). Horikawa discloses an Al alloy die cast piston that excels in fatigue strength at high temperature and antiwear quality. Horikawa at English-language abstract. Horikawa discloses that the Al alloy piston contains 0.5-2.0 wt.% Mg. Horikawa at English-language abstract.

However, Horikawa fails to suggest the "consisting of" limitation of independent Claims 5 and 7-9, which excludes the "0.5-2.0 wt.% Mg" required by Horikawa.

The Office Action asserts:

With respect to the language "consisting of" and the 0.5 to 2.0 weight percent magnesium as disclosed by Horikawa et al. (JP '428), the Examiner notes that Horikawa et al. (JP '428) disclose that 0.5 to 2.0 weight percent present in the aluminum alloy would remarkably improved mechanical strength [0010]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to omit the 0.5 to 2.0 weight percent magnesium where remarkable mechanical strength would not be required or desired. MPEP 2144.04(II) and 2123(II). Office Action at page 10, line 23 to page 11, line 2.

On the contrary, the **applied** English-language **machine translation** of Horikawa discloses at [0010]:

[0010] Hereafter, **the component of the aluminium alloy used by this invention, a content, manufacture conditions, etc. are explained.**
Si: It is the alloy content which crystallizes as a primary phase Si 11 to 16% of the weight, and improves thermal resistance and abrasion resistance. Moreover, it is a component effective also when reducing coefficient of thermal expansion with Eutectic Si and improving the fluidity at the time of casting. Furthermore, by aging treatment, it deposits as Mg₂ Si and mechanical strength is raised. Such effectiveness becomes remarkable with 11% of the weight or more of Si content. However, if Si of the excessive amount exceeding 16 % of the weight is contained, it will become easy to generate the big and rough primary phase Si leading to fatigue breaking. Moreover, it will be necessary to make casting temperature into an elevated temperature 730 degrees C or more.
Mg: Deposit as Mg₂ Si by aging treatment **0.5 to 2.0% of the weight**, and it is the alloy content which raises mechanical strength, and the addition effectiveness of Mg becomes remarkable at 0.5 % of the weight or more. However, if Mg content exceeds 2.0 % of the weight, at the time of casting, big and rough Mg₂ Si will crystallize and fatigue strength will deteriorate. On the other hand, **in less than 0.5% of the weight of Mg content, there are few amounts of deposits of Mg₂ Si by aging treatment, and reinforcement runs short.** English-language **machine translation** of Horikawa discloses at [0010] (emphasis added).

Because Horikawa discloses that "0.5-2.0 wt.% Mg" is an essential component of Horikawa's Al alloy, and Horikawa teaches away from less than 0.5 wt% Mg, there is no suggestion or motivation to omit Mg from Horikawa's Al alloy.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. MPEP 2143.01.V.

Thus, Horikawa fails to suggest the "consisting of" limitation of independent Claims 5, 7, 8 and 9, which excludes the "0.5-2.0wt% Mg" required by Horikawa. Therefore, the rejection over Horikawa should be withdrawn.

Any *prima facie* case of obviousness based on Nishi or Horikawa is rebutted by the significant improvement in Young's modulus to 90 GPa or more and linear thermal expansion coefficient to $18 \times 10^{-6}/^{\circ}\text{C}$ or less that is achieved by the present invention over the ranges of independent Claims 5, 7, 8 and 9 of "1-3.5% by mass of manganese" and "0.5-6% by mass of nickel". This is demonstrated in the attached Declaration Under 37 CFR 1.132.

For example, the Rule 132 Declaration at Table 2 shows that within the range of independent Claims 5, 7, 8 and 9 of "0.5-6% by mass of nickel" an improved combination of Young's modulus and linear thermal expansion coefficient is achieved relative to an alloy corresponding to Nishi with 0 mass% Ni.

In addition, the Rule 132 Declaration at Table 2 shows that within the range of independent Claims 5, 7, 8 and 9 of "1-3.5% by mass of manganese" an improved combination of Young's modulus and linear thermal expansion coefficient is achieved relative to an alloy corresponding to Horikawa containing 0.2 mass% Mn and 1.5 mass% Mg.

The cited prior art fails to suggest the improved combination of Young's modulus and linear thermal expansion coefficient that is achieved by the present invention over the ranges

of independent Claims 5, 7, 8 and 9 of "1-3.5% by mass of manganese" and "0.5-6% by mass of nickel".

Thus, any *prima facie* case of obviousness based on the cited prior art is rebutted. Therefore, the rejections under 35 U.S.C. § 103(a) should be withdrawn.

The disclosure is objected to. In addition, Claims 4-9 are rejected under 35 U.S.C. § 112, first paragraph. To obviate the objection and rejection, the specification at [0005] is amended to recite "0.3-3.5% by mass of manganese".

Applicants respectfully request that the Examiner acknowledge receipt of a certified copy of the priority document by initialing the appropriate boxes under section 12 on a Form PTOL-326.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

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Respectfully submitted,

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Attached: Declaration Under 37 CFR 1.132